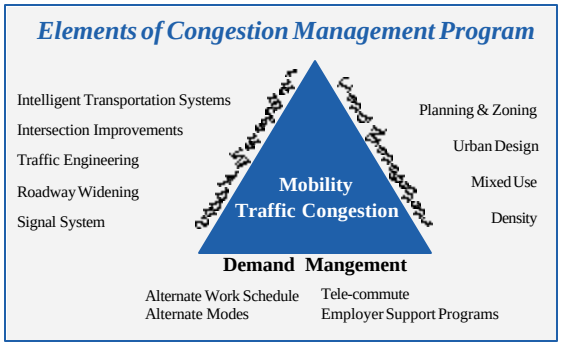
Greensboro 2000

Traffic Congestion Report

Traffic congestion is a core concern of our community. The level of traffic congestion experienced by the motoring public on a daily basis is a key measure of Greensboro's quality of life. Greensboro's leaders have long recognized the importance of good mobility and have supported transportation improvement projects over the years to maintain the integrity of our transportation system. A community can not grow and prosper if its transportation system can not meet the demands of a vibrant City. The citizens of Greensboro have also recognized the importance of our transportation system. A $75 million transportation bond package passed by the citizens of Greensboro in 1988 has provided a source for funding numerous transportation improvement projects over the past 12 years. As Greensboro grows, we must continue to evaluate our transportation system, develop transportation improvement projects, and seek funding of those projects.

The three 3 basic components of a mobility/congestion reduction program are:

- Supply Management – Where improvements or operational changes are made to the existing transportation system to increase capacity. Supply management strategies include roadway widening, intersection improvements, signal timing improvements, improved transit service, reversible lanes, and other ITS.
- Demand Management – Demand management strategies are intended to influence the intensity and timing of the demand placed on our transportation system. Such strategies include offering commuters one or more alternative transportation modes or services, providing incentives to travel during non-peak travel times, and incorporating growth management policies into local development issues.
- Land Use Management – Exercising control over the trip generating characteristics of the land use can be used to make the resulting demand consistent with the existing transportation infrastructure and desired level of service.



The Greensboro Traffic Congestion Report is an annual report produced by the Greensboro Department of Transportation that identifies deficiencies in our transportation system and recommends transportation improvement projects. The *Greensboro Traffic Congestion Report* 2000 focuses primarily on supply management and analyzes current traffic patterns and past traffic trends to determine traffic "hot spots". An inventory of existing traffic volumes, existing traffic patterns, and an evaluation of the City's current street network were evaluated to determine operational deficiencies. Various improvement projects such as additional travel lanes, additional turn lanes, lane reconfiguration, traffic signal modifications, and Intelligent Transportation Systems (ITS) were evaluated. Recommended improvements were determined by comparing the benefits of each project to the cost of each project.

The report identifies immediate 1-5 year transportation needs along Major and Minor Thoroughfares and at Major Intersections. The report does not identify Interstate or Freeway deficiencies/improvements and is not intended to be a future long-range transportation improvement document. Transportation Improvement Projects identified in this report will be funded from a variety of sources such as City of Greensboro Bonds, Powell Bill Funds, and various State Transportation funding sources.

Background:

Rapidly increasing vehicle miles traveled combined with changing commuter patterns has lead to significant increases in traffic congestion in our urban areas. Between 1980 and 1995 traffic congestion in the Nations urban areas has nearly doubled from 7.3 million daily person-hours of delay to 14.2 million daily person-hours of delay.

Traffic congestion affects our community in several ways:

> Local Impacts - Drivers frustrated with chronic congestion look for ways to bypass bottlenecks, oftentimes cutting through residential streets that are not designed to safely accommodate the high volumes and high speeds associated with cut-through traffic. Such bypass traffic often becomes the focus of neighborhood complaints. The number 1 complaint received by GDOT is "speeding traffic in my neighborhood"

> Economic Development - A safe and efficient transportation system are important selling points for communities that desire to attract new businesses. The safe and efficient movement of goods and services has a direct impact on sound economic growth and productivity.

> Quality of life - To a lot of people, congested/unsafe streets are a symptom of deteriorating quality of life. Many residents have moved to our community to escape urban problems like traffic jams. Greensboro is no longer a 15 minute City, but has become a 30 minute City.

> Road Rage - Increased congestion causes driver frustration and has lead to a new phenomenon called "Road Rage". "Road Rage" is associated with aggressive driving behaviors such as speeding, running red lights, following too close and improper passing. Aggressive driving behavior has become the second leading cause for traffic fatalities nationwide.

> Environmental Quality - Traffic congestion has a detrimental effect on air quality. Making improvements to the transportation system and changing travel behavior is an important objective to improving our environment.

Traffic conditions in Greensboro mirror nationwide statistics. In a very short time Greensboro's street system has become heavily congested. The 1994 Greensboro Traffic Congestion Report identified 33 intersections operating over capacity and 26 miles of major arterial streets operating over capacity. In 2000 the number of intersections operating over capacity has increased to 94 intersections the number of miles of Arterial Streets operating over capacity has grown to 50 miles. We must act now to lessen traffic congestion and preserve Greensboro's quality of life by optimizing our existing transportation system and making key system improvements to enhance mobility in a growing community.

Traffic Congestion:

The capacity of a roadway facility can be defined as the maximum rate at which vehicles reasonably can be expected to traverse a roadway section during a given time period. Congested conditions occur when traffic demand on the roadway system is greater than the available roadway capacity. The results of traffic congestion are long queues of traffic at intersections and unacceptable travel times along roadway sections, which lead to driver frustration and deteriorated quality of life for daily commuters.

The intent of this report is to conduct a comprehensive evaluation of the City's existing transportation system, determine system deficiencies, and recommend improvement projects. In the past this report has been used to determine roadway improvement projects such as intersection improvements, arterial improvements, and ITS projects. Many of the improvement projects identified in this report and past congestion management reports have been placed in the 2000 Transportation Bond Package for funding.

Intersection Traffic Congestion:

Most traffic congestion in urban areas occurs at the intersection of major/minor arterial streets. Traffic signals control the flow of traffic at these intersections. Signal timing/phasing, traffic volumes, number/width of travel lanes, and the number/width of turning lanes, determine the capacity at signalized intersections.

Over the past 10 years traffic volumes have increased by a Citywide average of 21% at signalized intersections. Traffic volumes at some of our highest growth intersections have more than doubled in the past 10 years. The tremendous growth in traffic has lead to a growing number of signalized intersections that are operating over capacity. In 1999 we conducted capacity analysis at our high growth/high volume intersections and determined that 94 intersections are operating over capacity during peak travel times. As compared to a similar analysis conducted in 1993 where we performed capacity analysis at all of our signalized intersections and observed that 33 intersections were operating over capacity during peak travel times. See Figure 2 for a list of our most congested intersections and proposed improvements at those locations to alleviate congestion.

Arterial Traffic Congestion:

The primary street network within the City of Greensboro consists of arterial streets. Urban Arterials are signalized streets that primarily serve through traffic. Many factors influence congestion along arterial streets including number of travel lanes, traffic volumes, median type, number of driveway access points, and signalized intersections. Traffic volumes have increased by 80% on our major thoroughfares over the past 10 years and the number of arterial streets operating over capacity has nearly doubled. In 2000 we conducted a planning level capacity analysis along all our major and minor arterial streets and found that 50 miles of Greensboro's Arterial System is operating over capacity during peak travel times. In 1994 a similar study revealed that 26 miles of Greensboro's Arterial System operating over capacity. See Figure 3 for a list of Greensboro's most congested arterial streets. These streets were determined to be operating over capacity because existing traffic volumes currently exceed the theoretical capacity of the facility.

Figure 1 - Proposed Intersection Improvement Projects

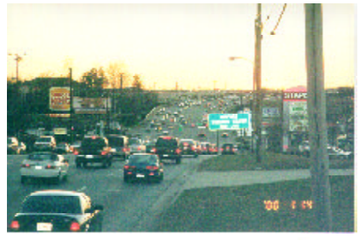
Intersection	Improvements	Cost
Battleground/Westridge	Dual NB left turn, additional travel Lane WB on Westridge to Whitehurst	$565,200
Battleground/Brassfield	Add SB right turn lane, Dual left turn lanes EB	$200,000
Battleground/Benjamin/Cone	Add NB and SB right turn lane SB Dual left turn lanes	$493,000
Battleground/Pisgah Church Rd.	Add NB, WB right turn lane Intersection realignment	$196,800
Battleground/Cornwallis	Add NB right turn lane	$56,000
Wendover/I-40	Remove island on bridge and create Additional outbound travel lane	$90,000
Wendover/Big Tree Way	Add EB dual left turn lanes	$150,000
Wendover/Stanley Rd.	Add NB dual left turn lanes Add WB right turn lane	$312,000
Wendover/Landmark Center	Add SB dual left turn lanes Add WB right turn lane	$163,000
Wendover/Bridford Pkwy	Add NB, SB dual left turn lanes	$245,000
NC-68/Triad Center Drive	Add NB Dual left turn lanes Add EB Dual left and dual right lanes	$250,000
NC-68/Thorndike Rd.	Add NB Dual left turn lanes Add EB Dual left and dual right lanes	$250,000
High Point Rd/Hilltop Rd.	Add 2 WB through lanes, SB dual left Turns, add islands to restrict access	$370,000
Guilford College/Market St.	Add, WB, NB right turns, add NB,EB, Dual left turns.	$479,000
Market Street/NC-68/Thatcher	Add NB,SB dual left turns, Add NB,SB Dual right turns	$530,000
Hilltop/Fairfax	Add EB left turn lane	$90,000
Lee St/Chapman St.	Realign intersection	$133,000
		Total $4,572,000

Figure 2 - Top 25 Congested Intersections

Rank	Location	Daily Traffic	Growth	Proposed Project	Cost
1	Battleground/Westridge	53,435	3%	Intersection Imp./City	$565,200
2	NC-68/Triad Center Dr.	65,201	4%	Intersection Imp./City/NCDOT	$250,000
3	Bryan Blvd/Regional Rd.	42,832	9%	Airport Regional Study	TBA
4	NC-68/Pleasant Ridge Rd	65,500	8%	Airport Regional Study	TBA
5	NC-68/Thorndike Rd	45,522	11%	Intersection Imp./City/NCDOT	$250,000
6	Pomona Dr./Sp. Garden	50,881	6%	Intersection Imp./City	$225,000
7	Green Valley/Market	28,954	3%	No Project at this time	TBA
8	Benjamin Pkwy/Pembroke	40,924	10%	Benjamin Corridor Imp.	(On Hold)
9	Benjamin Pkwy/Elam	48,264	12%	Benjamin Corridor Imp.	(On Hold)
10	Dolley Madison/Friendly	43,148	4%	No Project at this time	TBA
11	Benjamin Pkwy/Campus	31,860	7%	Intersection Imp.	$25,000
12	Fairfax/Hilltop	31,106	13%	Intersection Imp.	$90,000
13	Benjamin Pkwy/Aycock	43,224	7%	No Project at this time	TBA
14	Gallimore Dairy/Market	18,941	3%	Gallimore Dairy Corridor Imp.	(2000 Bond)
15	Albert Pick/Regional Rd	27,955	6%	No Project at this time	TBA
16	Pleasant Garden/US-421	36,976	5%	No Project at this time	TBA
17	Aycock/Spring Garden	62,265	5%	No Project at this time	TBA
18	Benjamin Pkwy/Cornwallis	47,859	16%	Benjamin Corridor Imp.	(On Hold)
19	Creek Ridge/Randleman Rd.	47,842	3%	Creek Ridge Corridor Imp.	(2000 Bond)
20	Friendly/Jefferson	41,952	6%	No Project at this time	TBA
21	Cone/Elm	52,394	10%	Intersection Imp. (On Hold)	$150,000
22	Battleground/Brassfield	45,667	8%	Intersection Imp.	$200,000
23	Elm-Eugene/Meadowview	37,060	3%	No Project at this time	TBA
24	Guilford College/Swing	40,564	7%	Guilford College Rd./I-40 Widening	
25	Church/Cornwallis	35,154	8%	Church Street Corridor Imp.	(2000 Bond)

Figure 3 - Greensboro Highly Congested Arterials

Thoroughfare	From	To	1990 Volume	1999 Volume	Comments	Cost
Airport Pkwy.	NC-68	Old Oak Ridge	8,800	35,500	Fed-Ex/I-77 Imp.	TBA
Battleground Av.	Cotswold Terr.	Westridge Rd.	32,000	43,000	2000 Bond Imp	$3,000,000
Battleground Av.	Westridge Rd.	Wendover	41,200	58,400	Future ITS corridor	TBA
Benjamin Pkwy.	Bryan Blvd	Wendover Ave.	19,900	41,200	(On Hold)	$1,500,000
Bryan Blvd.	Westridge Rd.	Benjamin Pkwy.	9,100	32,800	Possible ITS corridor	TBA
Church St.	Cone Blvd.	Wendover Av.	16,000	22,700	2000 Bond Imp.	$2,000,000
Cornwallis Dr.	Battleground	Church St.	10,500	19,600	No planned Imp.	
Elm St	Cone	Northwood	19,300	26,500	(On Hold)	$500,000
Friendly Avenue	Westridge Rd.	Holden Rd.	21,800	33,900	2000 Bond Imp.	$2,500,000
Friendly Avenue	Holden Rd.	Aycock St.	25,200	31,100	No planned Imp.	
Groometown Rd.	Vandalia Rd.	I-85	11,500	17,000	State TIP, 2005	$6,500,000
Guilford Coll.Rd.	Mackay Rd.	I-40	13,400	20,100	State TIP, 2001	$11,300,000
High Point Rd.	Hilltop Rd.	Mackay Rd.	22,200	26,300	State TIP, 2004	$52,800,000
Holden Rd.	Friendly Av.	Meadowview Rd.	37,700	46,800	No Planned Imp.	
Lawndale Dr.	Lake Jeanette	Cone Blvd.	16,000	28,400	No Planned Imp.	
Lee Street	Elm St.	Chapman St.	27,500	32,200	No Planned Imp.	
Market St.	Pleasant Ridge	NC-681	16,900	18,800	2000 Bond/STIP	$4,000,000
Market St.	Gallimore Dairy	Holden Rd.	27,700	35,900	No Planned Imp.	
Merritt Dr.	I-40	High Point Rd.	16,000	21,000	2000 Bond Imp.	$3,500,000
Muirs Chapel Rd.	Market St.	Tower Rd.	20,000	29,800	Imp. Complete	
NC-68	Pleasant Ridge	Wendover Ave.	28,500	46,800	2000 Bond/STIP	$2,000,000
New Garden Rd.	Battleground	Ballinger Rd.	14,200	21,000	City Imp. 2003	$5,300,000
New Garden Rd.	Ballinger Rd.	Friendly Ave.	28,000	33,600	No Planned Imp.	
Randleman Rd.	Creek Ridge Rd.	I-40	29,000	31,100	No Planned Imp.	
Spring Garden St.	Market St.	Holden	26,900	40,300	No Planned Imp.	
Spring Garden St.	Holden Rd.	Aycock St.	18,400	24,500	No Planned Imp.	
Summit Ave.	Yanceyville St.	Wendover Av.	25,200	32,000	No Planned Imp.	
Wendover Av.	Bridford Pkwy	I-40	26,200	58,400	2000 Bond Imp.	$2,000,000
Wendover Av.	I-40	Spring Garden	51,100	61,000	Possible ITS Corridor	TBA
Wendover Av.	Spring Garden	Battleground	47,000	58,500	Possible ITS Corridor	TBA
Wendover Av.	Battleground	Cridland	58,700	74,300	Possible ITS Corridor	TBA
Wendover Av.	Cridland Rd.	Yanceyville St.	42,700	60,200	Possible ITS Corridor	TBA
Wendover Av.	Yanceyville St.	US-29	39,500	48,300	Possible ITS Corridor	TBA



Intelligent Transportation Systems (ITS)

Increasing roadway capacity and reducing traffic congestion has traditionally been accomplished through roadway widening projects. Roadway widening projects are becoming more and more difficult to construct because of environmental issues, political issues, and the high cost of acquiring right of way along developed areas. Intelligent Transportation Systems (ITS) offer several tools to improve roadway capacity without the impacts of traditional roadway widening projects. ITS improves roadway capacity through the use of advanced technologies and communications such as computerized traffic signal systems, traffic surveillance cameras, advance traveler information, smart transit systems, reversible travel lanes, and variable message signs.

Greensboro has been a leader throughout North Carolina and the Nation in the deployment of ITS projects such as the computerized traffic signal system, traffic surveillance system, Coliseum traffic management system, Greensboro traffic management center, and the Channel 13 live traffic broadcast.

ITS is an important key to managing traffic congestion in Greensboro. Increased demands on our transportation system and limited resources have forced us to look at new ITS technologies to manage the capacity of our existing transportation system.

The City of Greensboro has been working with NCDOT on the development of a Regional ITS plan that identifies ITS projects for the Triad Region. The following ITS projects have been identified in the Regional Plan to manage traffic congestion in Greensboro.

Proposed ITS Projects

Project:	Description	Cost:
Fiber Optic Communication Infrastructure	Replace the existing copper communications system with a fiber optic system to Communicate between various ITS elements and the traffic management center.	$5,250,000
Signal System Replacement	Replace the existing traffic signal system with a new central traffic signal system	$9,000,000
Expand Video Surveillance System	Install sixty (60) video surveillance cameras to monitor traffic and provide real time information to motorists.	$1,500,000
Vehicle Detection	Install vehicle detection to report speeds, Volumes along major routes. Information Will be connected to smart map.	$500,000
Smart Map	Real time traffic information map providing Information about congested roadway	$100,000
Expand Freeway Management System	Expand VMS along interstates and freeways	$6,000,000
Arterial Congestion Managemant	Develop ITS projects such as reversible lanes, VMS and cameras along congested corridors.	$5,000,000
Kiosks	Install traffic information kiosks at local/regional attractions, to provide real-time traffic information.	$750,000
Cable Channel Broadcast	Enhance live traffic broadcast over City Cable Channel 13	$250,000